Stable and high-yielding intrinsic $^{59}$Fe-radiolabeling of the intravenous iron preparations Monofer and Cosmofer

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Commercial iron supplements Monofer(R) and Cosmofer(R) were intrinsically radiolabeled with Fe-59 for the purpose of tracing iron absorption in vivo. Optimized procedures aimed at introducing Fe-59 into the macromolecular construct in a form that was as chemically equivalent to the matrix iron as possible. This was determined by challenging the labeled constructs with diethylenetriaminepentaacetic acid (DTPA) followed by separation by size-exclusion and measurements of radioactivity and iron in the eluted fractions. The final procedures were simple and involved heating aqueous dispersions of the supplements in the presence of [Fe-59]FeCl$_3$ for 24h at 95 degrees C for Monofer, and 85 degrees C for Cosmofer, resulting in radiochemical yields greater than 94%. High performance size exclusion chromatography, UV-VIS spectroscopy, and dynamic light scattering were used to show that the supplements remained unchanged after radiolabeling, underscoring the applicability of the methodology for radiolabeling commercial iron preparations.

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